Mathematics (or Astrophysics and Geophysics)

HEAT TRANSFER IN TORNADOES AND SUPERCELL THUNDERSTORMS

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We study temperature distribution in a cylindrical thermal bubble at the ground level in the atmosphere. Such bubbles are extensively used in numerical experiments for storm initiation. We use laws of thermodynamics and techniques from partial differential equations to obtain a formula for temperature distribution in the bubble. By varying radii and thermal conductivity we analyze the role of conduction as well as the role of other mechanisms of heat transfer in the storm initiation.